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This is the only case in which a continual solar eclipse is manifested, and this, as appears by the paper, only takes place for intervals of very limited duration and in particular latitudes. The most ordinary solar eclipses which are manifested are such as are of short duration, the sun being carried by the diurnal motion under one or other of the rings, or successively under both of them, and the duration of the eclipses being determined, not as assumed by Dr. Mädler, by the declination only, but by the diurnal motion and the conditions which determine the obliquity of the parallels of declination to the edges of the rings.

It is also shown that no zone of the heavens is constantly visible in the interval between the rings, except between the latitudes 56° and 58°, and there a zone bounded by two parallels very close together is alone visible. At all other latitudes the parallels of declination, which at one altitude pass between the rings, are at other altitudes covered by them.

None of the satellites, except the eighth, are ever eclipsed by the rings, except at or very near the Saturnian equator, where they are intercepted by the thickness of the rings. The eighth satellite, however, having an orbit inclined to the plane of the rings at about 13°, phenomena are developed in its monthly motion, which are analogous to the solar eclipses described above.

The thickness of the rings being unascertained, the author assumes its probable major and minor limits, and investigates the manner in which it would modify the phenomena.

To form a judgment of the interest and importance of this paper, it will, however, be necessary to refer to the paper itself, since it is rather on the details than any general views that the novelty and interest of the points developed in it depends.

Extract of a Letter from Sig. Secchi to the Astronomer Royal.

" I have the honour to announce to you the discovery of a new comet, found yesterday evening at $6^{h}\frac{1}{4}$ in the constellation *Lepus*, near the star μ. A first comparison with a small star of the 10th magnitude, which was very near the comet, showed that it was moving with rapidity towards the north. Here are the observations, made immediately afterwards by comparison with a star (*a*) of the 9th magnitude, with a ring micrometer on the equatoreal of Cauchoix.

1853.	Rome Mean Time. h m s			
March 6	8 55 42	Comet's R.A. = (*a*) + 7·01 s	Decl. = (*a*) − 8′ 14″?	
	9 43 51	— — = (*a*) + 1·07	— = (*a*) −13 29·7	

" The position of the star (*a*) has been obtained relatively to No. 9420 of the H.C. of Lalande, by the intermediate use of another star (*e*), and is as follows:—

	h m s		° ′ ″
App. R.A. (*e*)	= 4 53 46·32	Decl. (*e*)	= −16 19 20·14
— — (*a*)	= 4 52 38·77	— (*a*)	= −15 59 1·38

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whence we conclude for the comet,

	Rome M.T. h m s	Comet's R.A. h m s	Comet's Decl. South. ° ′ ″
March 6	8 55 42	4 52 45·78	−15 50 47·2
	9 43 51	4 52 39·84	−15 45 41·7

Approximate Hourly Motion.

In R.A. = $7^{s}\cdot4$ In Decl. 6′ 33″

" These observations are not corrected for the effects of refraction. The comet was a tolerably fine one. It had a large coma of about 5′, of which the brightest portion, of about 3′ in diameter, exhibited a small luminous point, which was taken for the point of observation: but it was not *too* distinct; it appeared even to have several of these points.*

" On the same evening there was found also a very feeble nebula in the constellation *Leo*. It follows the star γ by $3^{m}\ 34^{s}$, and is north of it by about 3′. It is not in the catalogue of Sir John Herschel. The two centres, or most luminous points, are separated by about 3^{s} in right ascension and by 3′ in declination, and connected by a feeble nebulosity."

"*Rome, March* 7, 1853."

The comet referred to in the foregoing letter was also discovered independently by Prof. Schweizer, at Moscow, on March 8, and by Dr. Hartwig, at Leipsic, on March 10. It was also discovered in America on March 8, as appears by the following message, which was telegraphed from Boston to New York, and transmitted to the Astronomer Royal by the steamer Arabia. The steamer, it is believed, was just on the point of sailing from the latter port when the message arrived.†

"*Boston, 9th March.*

" A comet was discovered at Harvard Observatory last evening, by C. W. Tattle. It is situated about five degrees south of the bright star *Rigel*."

M. D'Arrest, who has calculated the elements of this comet, remarks that they exhibit a distant resemblance to those of the comet of 1664. This would imply a period of about 188 years. It will readily be seen, by simple inspection of a Comet catalogue,

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* This would seem to constitute the incipient symptom of a breaking up of the comet into several distinct parts, as in the case of Biela's comet. Hevelius remarks that a similar phenomenon was observed on the occasion of the apparition of the great comet of 1618. In the month of November, when the comet was first seen, the head presented the appearance of a nebulous mass of light. On the 20th of December it appeared to Cysatus at Rome to resemble a number of small stars (*Cometographia*, p. 417). Hevelius states that he himself observed a similar appearance in the head of the comet of 1661 and several other comets.—*Ib.* p. 341.—R. G.

† The original slip, as printed by the telegraph, was sent to the Royal Observatory.

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that the agreement in this respect is *closer* than that which subsists between the elements of the new comet and those of any other comet whose orbit has been hitherto calculated. This is all which we are warranted in affirming in the present state of the subject. The question of identity, however, can only be *established* by a rigorous computation of the disturbing forces acting upon either of the two comets during the period comprised between their respective apparitions. The following comparison of the orbits of the two bodies will serve to exhibit the extent of their resemblance. The elements of the comet of 1664 are those given by M. D'Arrest. Both comets are referred to the mean equinox of 1853·0.

	Comet of 1664.	Comet (1) of 1853.
T	1664, Dec. 4·501 M.T. Par.	1853, Feb. 24·2797 M.T. Par.
	° ′	° ′ ″
π	133 18	153 21 11·7
☊	83 51	69 49 47·9
i	21 18	20 19 47·0
Log *q*	0·01104	0·038920
	Motion retrograde.	Motion retrograde.

The comet has been rapidly receding from the earth since its first apparition in Europe. When it passed its perihelion on the 24th of February, its declination *south* was 56° 32′. On the 30th of March, its declination *north* was 9° 22′. It would, consequently, have been very favourable for observation in the southern hemisphere. In all probability it has been observed at the Cape and other places on the southern side of the equator, several weeks previous to its apparition in Europe.

Reduction of the Observations of Eclipses of Jupiter's Satellites, Occultations of Stars by the Moon, and other Astronomical Phenomena, made by the late Rev. Thomas Catton, B.D., Fellow of St. John's College, Cambridge. By G. B. Airy, Esq., Astronomer Royal.

There is a preface to this paper by Mr. Airy, from which the following particulars are extracted.

The observations embrace a period of years extending from 1791 to 1832. The expense of their reduction, and of the printing of the results, has been defrayed from the fund placed by the Lords Commissioners of her Majesty's Treasury at the disposal of the Royal Society, for the aid of scientific enterprises undertaken by private individuals.

Mr. Catton's observatory was situate on one of the towers of St. John's College, Cambridge. Its exact position with respect to the Cambridge observatory was determined geodetically, previous to the reduction of the observations, by Professor Miller and Mr. Adams.

Mr. Catton's observations in right ascension were made with a